

3.4

#6 $h(x) = -4x^2 + 4.7x - 6$

opens downward (since the lead coefficient is negative)

#10

$f(x) = -8(x+12)^2 + 9$

opens downward (coeff $-8 < 0$)

Vertex $(h, k) = (-12, 9)$

#22 vertex $(-3, 2)$ point $(2, 1)$

$f(x) = a(x-h)^2 + k$

$f(x) = a(x+3)^2 + 2$

but

$1 = f(2) = a \cdot 25 + 2$

$-1 = 25a$
 $-\frac{1}{25} = a$

$f(x) = -\frac{1}{25}(x+3)^2 + 2$

#32

$g(x) = -4x^2 - 16x + 9$

Vertex (h, k)

$h = \frac{-b}{2a} = \frac{-(-16)}{2(-4)} = \frac{16}{-8} = -2$

$k = g(-2) = -4(4) - 16(-2) + 9$
 $= -16 + 32 + 9 = 25$

Vertex $(-2, 25)$

#38

$g(x) = x^2 - 10x + 20$

if $x=0$ $y = 0 - 0 + 20$

$(0, 20)$

if $y=0$

$0 = x^2 - 10x + 20$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = \frac{10 \pm \sqrt{100 - 80}}{2} = \frac{10 \pm \sqrt{20}}{2}$

$x = \frac{10 \pm 2\sqrt{5}}{2} = \frac{2(5 \pm \sqrt{5})}{2}$

$x = 5 \pm \sqrt{5}$

$(5 \pm \sqrt{5}, 0)$

$\approx (7.236, 0)$
 $\approx (2.764, 0)$

3.4 CONTINUED

#42 $f(x) = (x-2)^2 + 1$

Vertex = $(h, k) = (2, 1)$

Axis $x = 2$

opens up

intercepts

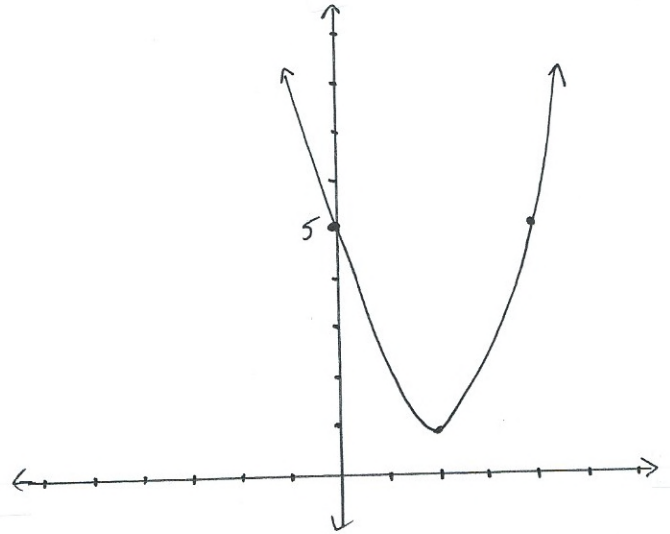
if $x = 0 \rightarrow y = 5$

if $y = 0 \rightarrow 0 = x^2 - 4x + 4 + 1$

$0 = x^2 - 4x + 5$

$x = \frac{4 \pm \sqrt{16 - 20}}{2}$

NO SOLUTION



3.5

#12 Supply $p = q^2 + q + 10$
Demand $p = -10q + 3060$ } FIND EQUILIBRIUM

$q^2 + q + 10 = -10q + 3060$

$q^2 + 11q - 3050 = 0$

$(q + 61)(q - 50) = 0$

$q = -61$ or $q = 50$

but quantity cannot be negative

EQUILIBRIUM QUANTITY

$q = 50$

EQUILIBRIUM PRICE

$p = -10(50) + 3060$

$p = -500 + 3060$

$p = \$2560$

#16

$R(x) = 300x - x^2$
 $C(x) = 65x + 7000$ } $0 \leq x \leq 150$

BREAK EVEN IF

$300x - x^2 = 65x + 7000$

$0 = x^2 - 235x + 7000$

$x = \frac{235 \pm \sqrt{235^2 - (4)(7000)}}{2} = \frac{235 \pm \sqrt{55225 - 28000}}{2}$

$= \frac{235 \pm \sqrt{27225}}{2} = \frac{235 \pm 165}{2}$

200 ← OUT OF RANGE

or 35

3.6

8) a) YES IT COULD BE A POLYNOMIAL

b) CAN NOT HAVE DEGREE 3

c) CAN NOT HAVE DEGREE 4

d) IT COULD BE A POLYNOMIAL OF DEGREE 5

#16 GRAPH $f(x) = (x-5)(x-1)(x+1)$

x INTERCEPTS $x=5, 1, -1$



$$f(-2) = (-7)(-3)(-1) = -21$$

$$f(0) = (-5)(-1)(1) = 5$$

$$f(2) = (-3)(1)(3) = -9$$

$$f(6) = (1)(5)(7) = 35$$

